

WE CLAIM:

1. An isolated polynucleotide selected from the group consisting of:
 - (a) a polynucleotide of SEQ ID NO:1,
 - (b) a polynucleotide with at least 60% identity to the polynucleotide sequence
5 of SEQ ID NO:1, and
 - (c) a polynucleotide of SEQ ID NO:1, with up to 100 conservative nucleotide substitutions;wherein the isolated polynucleotide encodes a polypeptide that infects *B. anthracis*.
- 10 2. The isolated polynucleotide of claim 1, wherein the isolated polynucleotide encodes a polypeptide that specifically binds to *B. anthracis* and RSVF1 at a level of 100 PFU/ml or greater, but binds to other *B. cereus* bacteria at a level of less than 100 PFU/ml.
3. An isolated nucleic acid consisting of the sequence of SEQ ID NO:1.
- 15 4. A DNA construct comprising an isolated nucleic acid molecule comprising the nucleotide sequence of an open reading frame of SEQ ID NO:1, operatively linked to a regulatory sequence.
5. An isolated nucleic acid molecule comprising at least 50 contiguous nucleotides of SEQ ID NO:1.
- 20 6. An isolated nucleic acid selected from the group consisting of a nucleic acid sequence encoding a polypeptide selected from the group consisting of: SEQ ID NO:3, SEQ ID NO:5, SEQ ID NO:7, SEQ ID NO:9, SEQ ID NO:11, SEQ ID NO:13, SEQ ID NO:15, SEQ ID NO:17, SEQ ID NO:19, SEQ ID NO:21, SEQ ID NO:23, SEQ ID NO:25, SEQ ID NO:27, SEQ ID NO:29, SEQ ID NO:31, SEQ ID NO:33, SEQ ID NO:35, SEQ ID NO:37, SEQ ID NO:39, SEQ
25 ID NO:41, SEQ ID NO:43, SEQ ID NO:45, SEQ ID NO:47, SEQ ID NO:49, SEQ ID NO:51, SEQ ID NO:53, SEQ ID NO:55, SEQ ID NO:57, SEQ ID NO:59, SEQ ID NO:61, SEQ ID NO:63, SEQ ID NO:65, SEQ ID NO:67, SEQ

ID NO:69, SEQ ID NO:71, SEQ ID NO:73, SEQ ID NO:75, SEQ ID NO:77, SEQ ID NO:79, SEQ ID NO:81, SEQ ID NO:83, SEQ ID NO:85, SEQ ID NO:87, SEQ ID NO:89, SEQ ID NO:91, SEQ ID NO:93, SEQ ID NO:95, SEQ ID NO:97, SEQ ID NO:99, SEQ ID NO:101, SEQ ID NO:103, SEQ ID NO:105, and SEQ ID NO:107.

7. An isolated nucleic acid that hybridizes under high stringency conditions to the coding sequence of SEQ ID NO:1, wherein said nucleic acid encodes a polypeptide that infects *B. anthracis*; wherein high stringency conditions refers to the following steps:

- (a) contacting the nucleic acid to a solution comprising 50% formamide, 5 x SSC (0.75 M sodium chloride, 0.075 M sodium citrate), 50 mM sodium phosphate (pH 6.8), 0.1% sodium pyrophosphate, 5 x Denhardt's solution, sonicated salmon sperm DNA (50 µg/ml), 0.1% sodium dodecyl sulphate, and 10% dextran sulfate at 42°C;
- (b) washing the nucleic acid at 42°C in 0.2 x SSC (0.75 M sodium chloride, 0.075 M sodium citrate) and 50% formamide at 55°C; and
- (c) contacting the nucleic acid with a high-stringency wash consisting of 0.1 x SSC (0.75 M sodium chloride, 0.075 N sodium citrate) containing EDTA at 55°C.

8. The isolated nucleic acid of claim 7, wherein the nucleic acid hybridizes under high stringency conditions to a nucleic acid sequence encoding a polypeptide selected from the group consisting of: SEQ ID NO:3, SEQ ID NO:5, SEQ ID NO:7, SEQ ID NO:9, SEQ ID NO:11, SEQ ID NO:13, SEQ ID NO:15, SEQ ID NO:17, SEQ ID NO:19, SEQ ID NO:21, SEQ ID NO:23, SEQ ID NO:25, SEQ ID NO:27, SEQ ID NO:29, SEQ ID NO:31, SEQ ID NO:33, SEQ ID NO:35, SEQ ID NO:37, SEQ ID NO:39, SEQ ID NO:41, SEQ ID NO:43, SEQ ID NO:45, SEQ ID NO:47, SEQ ID NO:49, SEQ ID NO:51, SEQ ID NO:53, SEQ ID NO:55, SEQ ID NO:57, SEQ ID NO:59, SEQ ID NO:61, SEQ ID NO:63, SEQ ID NO:65, SEQ ID NO:67, SEQ ID NO:69, SEQ ID NO:71, SEQ ID

NO:73, SEQ ID NO:75, SEQ ID NO:77, SEQ ID NO:79, SEQ ID NO:81, SEQ ID NO:83, SEQ ID NO:85, SEQ ID NO:87, SEQ ID NO:89, SEQ ID NO:91, SEQ ID NO:93, SEQ ID NO:95, SEQ ID NO:97, SEQ ID NO:99, SEQ ID NO:101, SEQ ID NO:103, SEQ ID NO:105, SEQ ID NO:107, SEQ ID NO:110, SEQ ID NO:111, SEQ ID NO:112 and SEQ ID NO:113, or the complement of thereof.

9. An isolated nucleic acid that hybridizes under high stringency conditions to a hybridization probe, the nucleotide sequence of which consists essentially of an open reading frame from SEQ ID NO:1, or the complement thereof; wherein high stringency conditions refers to the following steps:

- (a) contacting the nucleic acid to a solution comprising 50% formamide, 5 x SSC (0.75 M sodium chloride, 0.075 M sodium citrate), 50 mM sodium phosphate (pH 6.8), 0.1% sodium pyrophosphate, 5 x Denhardt's solution, sonicated salmon sperm DNA (50 µg/ml), 0.1% sodium dodecyl sulphate, and 10% dextran sulfate at 42°C;
- (b) washing the nucleic acid at 42°C in 0.2 x SSC (0.75 M sodium chloride, 0.075 M sodium citrate) and 50% formamide at 55°C; and
- (c) contacting the nucleic acid with a high-stringency wash consisting of 0.1 x SSC (0.75 M sodium chloride, 0.075 N sodium citrate) containing EDTA at 55°C.

10. A method of screening for a compound that binds to a polypeptide, the method comprising:

- (a) providing the nucleic acid of an open reading frame from SEQ ID NO:1;
- (b) introducing the nucleic acid into a cell and allowing the cell to produce the polypeptide encoded by the nucleic acid;
- (c) contacting a test compound with the polypeptide; and

(d) determining whether the test compound has bound to the polypeptide.

11. An isolated nucleic acid encoding a polypeptide which binds to the surface of *B. anthracis*, and having at least 60% nucleic acid sequence identity to a nucleic acid sequence encoding the polypeptide of SEQ ID NO:29; or a nucleic acid sequence encoding the polypeptide of SEQ ID NO:29 lacking its associated signal peptide; wherein the polypeptide that binds to the surface of *B. anthracis*.

12. An isolated nucleic acid encoding a polypeptide comprising the amino acid sequence set forth in SEQ ID NO:29, with up to 30 conservative amino acid substitutions, wherein the polypeptide binds to the surface of *B. anthracis*.

13. An isolated nucleic acid that hybridizes under high stringency conditions to the coding sequence of SEQ ID NO:29, wherein said nucleic acid encodes a polypeptide that binds to the surface of *B. anthracis*; wherein high stringency conditions refers to the following steps:

(a) contacting the nucleic acid to a solution comprising 50% formamide, 5 x SSC (0.75 M sodium chloride, 0.075 M sodium citrate), 50 mM sodium phosphate (pH 6.8), 0.1% sodium pyrophosphate, 5 x Denhardt's solution, sonicated salmon sperm DNA (50 µg/ml), 0.1% sodium dodecyl sulphate, and 10% dextran sulfate at 42°C;

(b) washing the nucleic acid at 42°C in 0.2 x SSC (0.75 M sodium chloride, 0.075 M sodium citrate) and 50% formamide at 55°C; and

(c) contacting the nucleic acid with a high-stringency wash consisting of 0.1 x SSC (0.75 M sodium chloride, 0.075 N sodium citrate) containing EDTA at 55°C.

14. An isolated nucleic acid that hybridizes under high stringency conditions to a nucleic acid sequence encoding the polypeptide of SEQ ID NO:29, a nucleic acid sequence encoding the polypeptide shown in SEQ ID NO:29 lacking its

associated signal peptide, or a nucleic acid sequence of the ORF 14 portion of SEQ ID NO:1,

(a) wherein said nucleic acid encodes a polypeptide that binds to the surface of *B. anthracis*; and

(b) wherein high stringency conditions refers to the following steps:

(i) contacting the nucleic acid to a solution comprising 50% formamide, 5 x SSC (0.75 M sodium chloride, 0.075 M sodium citrate), 50 mM sodium phosphate (pH 6.8), 0.1% sodium pyrophosphate, 5 x Denhardt's solution, sonicated salmon sperm DNA (50 µg/ml), 0.1% sodium dodecyl sulphate, and 10% dextran sulfate at 42°C;

(ii) washing the nucleic acid at 42°C in 0.2 x SSC (0.75 M sodium chloride, 0.075 M sodium citrate) and 50% formamide at 55°C; and

(iii) contacting the nucleic acid with a high-stringency wash consisting of 0.1 x SSC (0.75 M sodium chloride, 0.075 N sodium citrate) containing EDTA at 55°C.

15. A method of screening for a compound that binds to a polypeptide, the method comprising:

(a) providing the nucleic acid encoding the polypeptide of SEQ ID NO:29;

(b) introducing the nucleic acid into a cell and allowing the cell to produce the polypeptide encoded by the nucleic acid;

(c) contacting a test compound with the polypeptide; and

(d) determining whether the test compound has bound to the polypeptide.

16. An isolated polypeptide having at least 80% amino acid sequence identity to:

(a) the amino acid sequence of the polypeptide shown in SEQ ID NO:29; or

(b) the amino acid sequence of the polypeptide shown in SEQ ID NO:29,
lacking its associated signal peptide;

wherein the polypeptide is able to bind to the surface of *B. anthracis*.

5 17. An isolated nucleic acid encoding a polypeptide which binds to the surface of
B. anthracis, and having at least 60% nucleic acid sequence identity to a
nucleic acid sequence encoding the polypeptide of SEQ ID NO:35; or a nucleic
acid sequence encoding the polypeptide of SEQ ID NO:35 lacking its
associated signal peptide; wherein the polypeptide kills *B. anthracis*.

10 18. An isolated nucleic acid encoding a polypeptide comprising the amino acid
sequence set forth in SEQ ID NO:35, with up to 30 conservative amino acid
substitutions, wherein the polypeptide kills *B. anthracis*.

15 19. An isolated nucleic acid that hybridizes under high stringency conditions to the
coding sequence of SEQ ID NO:35, wherein said nucleic acid encodes a
polypeptide that kills *B. anthracis*; wherein high stringency conditions refers to
the following steps:

(a) contacting the nucleic acid to a solution comprising 50% formamide, 5 x
SSC (0.75 M sodium chloride, 0.075 M sodium citrate), 50 mM sodium
phosphate (pH 6.8), 0.1% sodium pyrophosphate, 5 x Denhardt's solution,
sonicated salmon sperm DNA (50 µg/ml), 0.1% sodium dodecyl sulphate,
20 and 10% dextran sulfate at 42°C;

(b) washing the nucleic acid at 42°C in 0.2 x SSC (0.75 M sodium chloride,
0.075 M sodium citrate) and 50% formamide at 55°C; and

(c) contacting the nucleic acid with a high-stringency wash consisting of 0.1 x
SSC (0.75 M sodium chloride, 0.075 N sodium citrate) containing EDTA at
25 55°C.

20. An isolated nucleic acid that hybridizes under high stringency conditions to a
nucleic acid sequence encoding the polypeptide of SEQ ID NO:35, a nucleic
acid sequence encoding the polypeptide shown in SEQ ID NO:35 lacking its

associated signal peptide, or a nucleic acid sequence of the ORF 17 portion of SEQ ID NO:1,

(a) wherein said nucleic acid encodes a polypeptide that kills *B. anthracis*; and

(b) wherein high stringency conditions refers to the following steps:

(i) contacting the nucleic acid to a solution comprising 50% formamide, 5 x SSC (0.75 M sodium chloride, 0.075 M sodium citrate), 50 mM sodium phosphate (pH 6.8), 0.1% sodium pyrophosphate, 5 x Denhardt's solution, sonicated salmon sperm DNA (50 µg/ml), 0.1% sodium dodecyl sulphate, and 10% dextran sulfate at 42°C;

(ii) washing the nucleic acid at 42°C in 0.2 x SSC (0.75 M sodium chloride, 0.075 M sodium citrate) and 50% formamide at 55°C; and

(iii) contacting the nucleic acid with a high-stringency wash consisting of 0.1 x SSC (0.75 M sodium chloride, 0.075 N sodium citrate) containing EDTA at 55°C.

21. A method of screening for a compound that binds to a polypeptide, the method comprising:

(a) providing the nucleic acid encoding the polypeptide of SEQ ID NO:35;

(b) introducing the nucleic acid into a cell and allowing the cell to produce the polypeptide encoded by the nucleic acid;

(c) contacting a test compound with the polypeptide; and

(d) determining whether the test compound has bound to the polypeptide.

22. An isolated polypeptide having at least 80% amino acid sequence identity to:

(a) the amino acid sequence of the polypeptide shown in SEQ ID NO:35; or

(b) the amino acid sequence of the polypeptide shown in SEQ ID NO:35, lacking its associated signal peptide;

wherein the polypeptide is able to kill *B. anthracis*.

23. An isolated nucleic acid encoding a polypeptide which binds to the surface of *B. anthracis*, and having at least 60% nucleic acid sequence identity to a nucleic acid sequence encoding the polypeptide of SEQ ID NO:83; or a nucleic acid sequence encoding the polypeptide of SEQ ID NO:83 lacking its associated signal peptide; wherein the polypeptide exhibits Fosfomycin resistance.

24. An isolated nucleic acid encoding a polypeptide comprising the amino acid sequence set forth in SEQ ID NO:83, with up to 30 conservative amino acid substitutions, wherein the polypeptide exhibits Fosfomycin resistance.

25. An isolated nucleic acid that hybridizes under high stringency conditions to the coding sequence of SEQ ID NO:83, wherein said nucleic acid encodes a polypeptide that exhibits Fosfomycin resistance; wherein high stringency conditions refers to the following steps:

(a) contacting the nucleic acid to a solution comprising 50% formamide, 5 x SSC (0.75 M sodium chloride, 0.075 M sodium citrate), 50 mM sodium phosphate (pH 6.8), 0.1% sodium pyrophosphate, 5 x Denhardt's solution, sonicated salmon sperm DNA (50 µg/ml), 0.1% sodium dodecyl sulphate, and 10% dextran sulfate at 42°C;

(b) washing the nucleic acid at 42°C in 0.2 x SSC (0.75 M sodium chloride, 0.075 M sodium citrate) and 50% formamide at 55°C; and

(c) contacting the nucleic acid with a high-stringency wash consisting of 0.1 x SSC (0.75 M sodium chloride, 0.075 N sodium citrate) containing EDTA at 55°C.

26. An isolated nucleic acid that hybridizes under high stringency conditions to a nucleic acid sequence encoding the polypeptide of SEQ ID NO:83, a nucleic acid sequence encoding the polypeptide shown in SEQ ID NO:83 lacking its associated signal peptide, or a nucleic acid sequence of the ORF 41 portion of SEQ ID NO:1,

(a) wherein said nucleic acid encodes a polypeptide that exhibits Fosfomycin resistance; and

(b) wherein high stringency conditions refers to the following steps:

(i) contacting the nucleic acid to a solution comprising 50% formamide, 5 x SSC (0.75 M sodium chloride, 0.075 M sodium citrate), 50 mM sodium phosphate (pH 6.8), 0.1% sodium pyrophosphate, 5 x Denhardt's solution, sonicated salmon sperm DNA (50 µg/ml), 0.1% sodium dodecyl sulphate, and 10% dextran sulfate at 42°C;

(ii) washing the nucleic acid at 42°C in 0.2 x SSC (0.75 M sodium chloride, 0.075 M sodium citrate) and 50% formamide at 55°C; and

(iii) contacting the nucleic acid with a high-stringency wash consisting of 0.1 x SSC (0.75 M sodium chloride, 0.075 N sodium citrate) containing EDTA at 55°C.

27. A method of screening for a compound that binds to a polypeptide, the method comprising:

(a) providing the nucleic acid encoding the polypeptide of SEQ ID NO:83;

(b) introducing the nucleic acid into a cell and allowing the cell to produce the polypeptide encoded by the nucleic acid;

(c) contacting a test compound with the polypeptide; and

(d) determining whether the test compound has bound to the polypeptide.

28. An isolated polypeptide having at least 80% amino acid sequence identity to:

(a) the amino acid sequence of the polypeptide shown in SEQ ID NO:83; or

(b) the amino acid sequence of the polypeptide shown in SEQ ID NO:83, lacking its associated signal peptide;

wherein the polypeptide exhibits Fosfomycin resistance.

29. An isolated polynucleotide selected from the group consisting of:

- (a) a polynucleotide of SEQ ID NO:2,
- (b) a polynucleotide with at least 60% identity to the polynucleotide sequence of SEQ ID NO:2, and
- (c) a polynucleotide of SEQ ID NO:2, with up to 100 conservative nucleotide substitutions;

wherein the isolated polynucleotide encodes a polypeptide that infects *B. anthracis*.

30. The isolated polynucleotide of claim 29, wherein the isolated polynucleotide encodes a polypeptide that specifically binds to *B. anthracis* and RSVF1 at a level of 100 PFU/ml or greater, but binds to other *B. cereus* bacteria at a level of less than 100 PFU/ml.

31. An isolated nucleic acid consisting of the sequence of SEQ ID NO:2.

32. A DNA construct comprising an isolated nucleic acid molecule comprising the nucleotide sequence of an open reading frame of SEQ ID NO:2, operatively linked to a regulatory sequence.

33. An isolated nucleic acid molecule comprising at least 50 contiguous nucleotides of SEQ ID NO:2.

34. An isolated nucleic acid selected from the group consisting of a nucleic acid sequence encoding a polypeptide selected from the group consisting of: SEQ ID NO:4, SEQ ID NO:6, SEQ ID NO:8, SEQ ID NO:10, SEQ ID NO:12, SEQ ID NO:14, SEQ ID NO:16, SEQ ID NO:18, SEQ ID NO:20, SEQ ID NO:22, SEQ ID NO:24, SEQ ID NO:26, SEQ ID NO:28, SEQ ID NO:30, SEQ ID NO:32, SEQ ID NO:34, SEQ ID NO:36, SEQ ID NO:38, SEQ ID NO:40, SEQ ID NO:42, SEQ ID NO:44, SEQ ID NO:46, SEQ ID NO:48, SEQ ID NO:50, SEQ ID NO:52, SEQ ID NO:54, SEQ ID NO:56, SEQ ID NO:58, SEQ ID NO:60, SEQ ID NO:62, SEQ ID NO:64, SEQ ID NO:66, SEQ ID NO:68, SEQ ID NO:70, SEQ ID NO:72, SEQ ID NO:74, SEQ ID NO:76, SEQ ID NO:78,

SEQ ID NO:80, SEQ ID NO:82, SEQ ID NO:84, SEQ ID NO:86, SEQ ID NO:88, SEQ ID NO:90, SEQ ID NO:92, SEQ ID NO:94, SEQ ID NO:96, SEQ ID NO:98, SEQ ID NO:100, SEQ ID NO:102, SEQ ID NO:104, SEQ ID NO:106, SEQ ID NO:108, and SEQ ID NO:109.

5 35. An isolated nucleic acid that hybridizes under high stringency conditions to the coding sequence of SEQ ID NO:2, wherein said nucleic acid encodes a polypeptide that infects *B. anthracis*; wherein high stringency conditions refers to the following steps:

- 10 (a) contacting the nucleic acid to a solution comprising 50% formamide, 5 x SSC (0.75 M sodium chloride, 0.075 M sodium citrate), 50 mM sodium phosphate (pH 6.8), 0.1% sodium pyrophosphate, 5 x Denhardt's solution, sonicated salmon sperm DNA (50 µg/ml), 0.1% sodium dodecyl sulphate, and 10% dextran sulfate at 42°C;
- 15 (b) washing the nucleic acid at 42°C in 0.2 x SSC (0.75 M sodium chloride, 0.075 M sodium citrate) and 50% formamide at 55°C; and
- (c) contacting the nucleic acid with a high-stringency wash consisting of 0.1 x SSC (0.75 M sodium chloride, 0.075 N sodium citrate) containing EDTA at 55°C.

20 36. The isolated nucleic acid of claim 35, wherein the nucleic acid hybridizes under high stringency conditions to a nucleic acid sequence encoding a polypeptide selected from the group consisting of: SEQ ID NO:4, SEQ ID NO:6, SEQ ID NO:8, SEQ ID NO:10, SEQ ID NO:12, SEQ ID NO:14, SEQ ID NO:16, SEQ ID NO:18, SEQ ID NO:20, SEQ ID NO:22, SEQ ID NO:24, SEQ ID NO:26, SEQ ID NO:28, SEQ ID NO:30, SEQ ID NO:32, SEQ ID NO:34, SEQ ID NO:36, SEQ ID NO:38, SEQ ID NO:40, SEQ ID NO:42, SEQ ID NO:44, SEQ ID NO:46, SEQ ID NO:48, SEQ ID NO:50, SEQ ID NO:52, SEQ ID NO:54, SEQ ID NO:56, SEQ ID NO:58, SEQ ID NO:60, SEQ ID NO:62, SEQ ID NO:64, SEQ ID NO:66, SEQ ID NO:68, SEQ ID NO:70, SEQ ID NO:72, SEQ ID NO:74, SEQ ID NO:76, SEQ ID NO:78, SEQ ID NO:80,

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SEQ ID NO:82, SEQ ID NO:84, SEQ ID NO:86, SEQ ID NO:88, SEQ ID NO:90, SEQ ID NO:92, SEQ ID NO:94, SEQ ID NO:96, SEQ ID NO:98, SEQ ID NO:100, SEQ ID NO:102, SEQ ID NO:104, SEQ ID NO:106, SEQ ID NO:108, and SEQ ID NO:109, or the complement of thereof.

5 37. An isolated nucleic acid that hybridizes under high stringency conditions to a hybridization probe, the nucleotide sequence of which consists essentially of an open reading frame from SEQ ID NO:2, or the complement thereof, wherein high stringency conditions refers to the following steps:

10 (a) contacting the nucleic acid to a solution comprising 50% formamide, 5 x SSC (0.75 M sodium chloride, 0.075 M sodium citrate), 50 mM sodium phosphate (pH 6.8), 0.1% sodium pyrophosphate, 5 x Denhardt's solution, sonicated salmon sperm DNA (50 µg/ml), 0.1% sodium dodecyl sulphate, and 10% dextran sulfate at 42°C;

15 (b) washing the nucleic acid at 42°C in 0.2 x SSC (0.75 M sodium chloride, 0.075 M sodium citrate) and 50% formamide at 55°C; and

(c) contacting the nucleic acid with a high-stringency wash consisting of 0.1 x SSC (0.75 M sodium chloride, 0.075 N sodium citrate) containing EDTA at 55°C.

20 38. A method of screening for a compound that binds to a polypeptide, the method comprising:

(a) providing the nucleic acid of an open reading frame from SEQ ID NO:2;

(b) introducing the nucleic acid into a cell and allowing the cell to produce the polypeptide encoded by the nucleic acid;

25 (c) contacting a test compound with the polypeptide; and

(d) determining whether the test compound has bound to the polypeptide.

39. An isolated nucleic acid encoding a polypeptide which binds to the surface of *B. anthracis*, and having at least 60% nucleic acid sequence identity to a nucleic acid sequence encoding the polypeptide of SEQ ID NO:30; or a nucleic acid sequence encoding the polypeptide of SEQ ID NO:30 lacking its associated signal peptide; wherein the polypeptide binds to the surface of *B. anthracis*.

40. An isolated nucleic acid encoding a polypeptide comprising the amino acid sequence set forth in SEQ ID NO:30, with up to 30 conservative amino acid substitutions, wherein the polypeptide binds to the surface of *B. anthracis*.

41. An isolated nucleic acid that hybridizes under high stringency conditions to the coding sequence of SEQ ID NO:30, wherein said nucleic acid encodes a polypeptide that binds to the surface of *B. anthracis*; wherein high stringency conditions refers to the following steps:

- (a) contacting the nucleic acid to a solution comprising 50% formamide, 5 x SSC (0.75 M sodium chloride, 0.075 M sodium citrate), 50 mM sodium phosphate (pH 6.8), 0.1% sodium pyrophosphate, 5 x Denhardt's solution, sonicated salmon sperm DNA (50 µg/ml), 0.1% sodium dodecyl sulphate, and 10% dextran sulfate at 42°C;
- (b) washing the nucleic acid at 42°C in 0.2 x SSC (0.75 M sodium chloride, 0.075 M sodium citrate) and 50% formamide at 55°C; and
- (c) contacting the nucleic acid with a high-stringency wash consisting of 0.1 x SSC (0.75 M sodium chloride, 0.075 N sodium citrate) containing EDTA at 55°C.

42. An isolated nucleic acid that hybridizes under high stringency conditions to a nucleic acid sequence encoding the polypeptide of SEQ ID NO:30, a nucleic acid sequence encoding the polypeptide shown in SEQ ID NO:30 lacking its associated signal peptide, or a nucleic acid sequence of the ORF 14 portion of SEQ ID NO:2,

(a) wherein said nucleic acid encodes a polypeptide that binds to the surface of *B. anthracis*; and

(b) wherein high stringency conditions refers to the following steps:

(i) contacting the nucleic acid to a solution comprising 50% formamide, 5 x SSC (0.75 M sodium chloride, 0.075 M sodium citrate), 50 mM sodium phosphate (pH 6.8), 0.1% sodium pyrophosphate, 5 x Denhardt's solution, sonicated salmon sperm DNA (50 µg/ml), 0.1% sodium dodecyl sulphate, and 10% dextran sulfate at 42°C;

(ii) washing the nucleic acid at 42°C in 0.2 x SSC (0.75 M sodium chloride, 0.075 M sodium citrate) and 50% formamide at 55°C; and

(iii) contacting the nucleic acid with a high-stringency wash consisting of 0.1 x SSC (0.75 M sodium chloride, 0.075 N sodium citrate) containing EDTA at 55°C.

43. A method of screening for a compound that binds to a polypeptide, the method comprising:

(a) providing the nucleic acid encoding the polypeptide of SEQ ID NO:30;

(b) introducing the nucleic acid into a cell and allowing the cell to produce the polypeptide encoded by the nucleic acid;

(c) contacting a test compound with the polypeptide; and

(d) determining whether the test compound has bound to the polypeptide.

44. An isolated polypeptide having at least 80% amino acid sequence identity to:

(a) the amino acid sequence of the polypeptide shown in SEQ ID NO:30; or

(b) the amino acid sequence of the polypeptide shown in SEQ ID NO:30, lacking its associated signal peptide;

wherein the polypeptide is able to bind to the surface of *B. anthracis*.

45. An isolated nucleic acid encoding a polypeptide which binds to the surface of *B. anthracis*, and having at least 60% nucleic acid sequence identity to a nucleic acid sequence encoding the polypeptide of SEQ ID NO:82; or a nucleic acid sequence encoding the polypeptide of SEQ ID NO:82 lacking its associated signal peptide; wherein the polypeptide is a spore surface antigen of *B. anthracis*.

46. An isolated nucleic acid encoding a polypeptide comprising the amino acid sequence set forth in SEQ ID NO:82, with up to 30 conservative amino acid substitutions, wherein the polypeptide is a spore surface antigen of *B. anthracis*.

47. An isolated nucleic acid that hybridizes under high stringency conditions to the coding sequence of SEQ ID NO:82, wherein said nucleic acid encodes a polypeptide is a spore surface antigen of *B. anthracis*; wherein high stringency conditions refers to the following steps:

- (a) contacting the nucleic acid to a solution comprising 50% formamide, 5 x SSC (0.75 M sodium chloride, 0.075 M sodium citrate), 50 mM sodium phosphate (pH 6.8), 0.1% sodium pyrophosphate, 5 x Denhardt's solution, sonicated salmon sperm DNA (50 µg/ml), 0.1% sodium dodecyl sulphate, and 10% dextran sulfate at 42°C;
- (b) washing the nucleic acid at 42°C in 0.2 x SSC (0.75 M sodium chloride, 0.075 M sodium citrate) and 50% formamide at 55°C; and
- (c) contacting the nucleic acid with a high-stringency wash consisting of 0.1 x SSC (0.75 M sodium chloride, 0.075 N sodium citrate) containing EDTA at 55°C.

48. An isolated nucleic acid that hybridizes under high stringency conditions to a nucleic acid sequence encoding the polypeptide of SEQ ID NO:82, a nucleic acid sequence encoding the polypeptide shown in SEQ ID NO:82 lacking its associated signal peptide, or a nucleic acid sequence of the ORF 39 portion of SEQ ID NO:2,

(a) wherein said nucleic acid encodes a polypeptide that binds to the surface of *B. anthracis*; and

(b) wherein high stringency conditions refers to the following steps:

(i) contacting the nucleic acid to a solution comprising 50% formamide, 5 x SSC (0.75 M sodium chloride, 0.075 M sodium citrate), 50 mM sodium phosphate (pH 6.8), 0.1% sodium pyrophosphate, 5 x Denhardt's solution, sonicated salmon sperm DNA (50 µg/ml), 0.1% sodium dodecyl sulphate, and 10% dextran sulfate at 42°C;

(ii) washing the nucleic acid at 42°C in 0.2 x SSC (0.75 M sodium chloride, 0.075 M sodium citrate) and 50% formamide at 55°C; and

(iii) contacting the nucleic acid with a high-stringency wash consisting of 0.1 x SSC (0.75 M sodium chloride, 0.075 N sodium citrate) containing EDTA at 55°C.

49. A method of screening for a compound that binds to a polypeptide, the method comprising:

(a) providing the nucleic acid encoding the polypeptide of SEQ ID NO:82;

(b) introducing the nucleic acid into a cell and allowing the cell to produce the polypeptide encoded by the nucleic acid;

(c) contacting a test compound with the polypeptide; and

(d) determining whether the test compound has bound to the polypeptide.

50. An isolated polypeptide having at least 80% amino acid sequence identity to:

(a) the amino acid sequence of the polypeptide shown in SEQ ID NO:82; or

(b) the amino acid sequence of the polypeptide shown in SEQ ID NO:82, lacking its associated signal peptide;

wherein the polypeptide is a spore surface antigen of *B. anthracis*.

51. A fusion polypeptide comprising a polypeptide of claims 16, 22, 28, 44 or 50 fused to a heterologous polypeptide.

52. A vector comprising the nucleic acid of claims 1, 11, 17, 23, 29, 39 or 45.

53. An expression vector comprising the nucleic acid sequence of claim 52,
5 operably associated with a promoter.

54. A host cell comprising the vector of claim 52.

55. A method for preparing a polypeptide, the method comprising the step of
culturing the host cell of claim 54 under conditions that permit expression of
the polypeptide from the expression vector, and isolating the polypeptide from
10 the host cell.